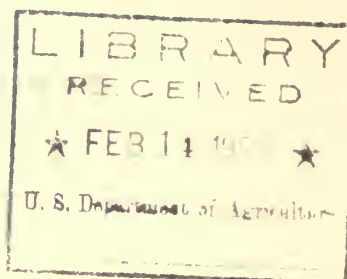


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SULPHUR AS A SOIL AMENDMENT

By

C. C. Fletcher

Bureau of Soils, U. S. Department of Agriculture.

Sulphur has been used as a soil amendment in the United States since Colonial Days. One of the classic examples of its use is Benjamin Franklin's experimental work near Philadelphia with gypsum. It is one of the essential elements for plant growth, but is usually found in sufficient quantities in most soils for normal crops. However, with the cultivation of soils there is a large loss of sulphur through drainage waters, which is partly but not completely corrected by its addition through rainfall.

In the early days, due to faulty chemical methods, the presence of sulphur in plants was minimized, but with improved technic it has been found that the percentage of sulphur is very much higher than was formerly supposed. This would make many chemists theoretically believe that sulphur should be added to the soil as a fertilizer. Aside from theory, experimental work, particularly in Oregon, has shown very good returns from the use of sulphur on special soils and crops. Apparently sulphur or a number of its compounds may have this beneficial effect.

The following table shows some of the common fertilizer materials with approximate amount of sulphur present. In addition the organic ammoniates (such as tankage, fish scrap, cottonseed meal, etc.) and manure all contain sulphur:

Material	P_2O_5	K_2O	NH_3	S
Acid phosphate	16	9
Ammonium sulphate	--25	24
Potassium sulphate (90 per cent)	--	50	...	16
Double potash manure salt	--	27	...	13
Gypsum	--	--	...	18

Possibly the fact that in the East large amounts of acid phosphate and mixed fertilizers are employed has held back the use of sulphur in this region. Acid phosphate contains approximately 50 per cent gypsum and most mixed fertilizers use acid phosphate as a base; consequently the farmers who employ either of these fertilizer materials are continually adding sulphur to their soil, although they pay nothing for it. It has been suggested that possibly some of the experimental work in which acid phosphate gave more favorable returns than raw rock phosphate may be interpreted to mean that the increased crop yields were due in some cases to the sulphur present in the acid phosphate. Elemental sulphur is relatively cheap; it is in a concentrated form and will thus stand transportation charges more readily than some of the other forms of sulphur:

however, it has to have a favorable soil or be artificially inoculated to give its best returns.

Many Fertilizers Contain Sulphur

It might not be amiss to note here that many other commercial fertilizer materials that are applied either separately or in the form of mixed fertilizers contain appreciable amounts of sulphur. Notable among these are potassium sulphate, double manure salts, ammonium sulphate, and the organic ammoniates, containing protein; such as tankage, fish scrap, dried blood, cottonseed meal, etc. A survey of the experimental work on crops would indicate a wide diversity of results. Alfalfa and peanuts stand out as two crops especially benefitted by the use of sulphur. Many crops, however, such as corn and cotton, show no consistent returns from its use. As sulphur has a tendency to render the soil more acid, it may have to be used in connection with lime where acidity is an adverse factor. However, this very quality renders it a benefit in alkaline soil and it has been recommended for the treatment of black alkali, with the object of changing the highly deleterious sodium carbonate to less harmful compounds.

As in the case of most of the soil amendments and fertilizers, it is difficult even to indicate the proper amount to apply. The soil type, crop, climate, previous cropping history of the soil and other factors have to be considered. In some instances experiments indicate a loss rather than a gain in the crop yield. Taking the conditions in Oregon, where sulphur has been recognized for some time as a valuable soil amendment, an application of 40 lb. per year per acre of sulphur has been found satisfactory. A comparable amount in the form of superphosphate or gypsum can be used.

Now in Experimental Stage

While we believe that sulphur will in the future have a very much more extended use, outside of limited areas, at the present time, it should be considered in an experimental stage and most certainly a widespread propaganda to substitute it for the conventional commercial fertilizer materials might do grave harm. In this statement, however, I am not referring to its acknowledged value as a treatment for various deleterious animal and vegetable pests of the farm, but merely to its direct use as a soil amendment. To anyone wishing to follow up the experimental work done in this country, we suggest that he consult the experiment station and Department of Agriculture of New Jersey, Wisconsin, Illinois, Kentucky, Iowa, Texas, Oregon and California, or obtain from the United States Department of Agriculture a copy of a bibliography on the publications on this subject.